LEMBAR
HASIL PENILAIAN SEJAWAT SEBIDANG ATAU *PEER REVIEW*
KARYA ILMIAH : Prosiding Internasional Terindex Scopus

Judul Publikasi Ilmiah (Artikel)		:	Recovery Chrom (VI) From Electroplating Waste Using Supported Liquid Membrane (SLM) Method, A Study Of The Influence Of NaCl And pH In Receiving Phase On Transport
Jumlah Penulis		:	3 orang
Status Pengusul		:	penulis pertama/utama
Identitas Jurnal Ilmiah	a. Nama Jurnal Ilmiah:		IOP Conf Ser: mater.Sci. Eng 205 (2017)
	b. Nomor ISBN /ISSN		ISBN : 19366612, 19367317
	c. Volume, Nomor, Bulan, Tahun		205 (2017)
	d. Penerbit		IOP Publishing
	e. DOI artikel (jika ada)		doi:10.1088/1757-899X/205/1/012010; http://iopscience.iop.org/article/10.1088/1757-899X/205/1/012010
	f. Alamat web jurnal		http://iopscience.iop.org/
	g. Terindeks di SCOPUS		
	e. Jumlah Halaman		5 (1-5)

Kategori Publikasi Jurnal Ilmiah : ☑ Prosiding Internasional / Internasional Bereputasi **
Hasil Penilaian *Peer Review*

Komponen Yang Dinilai	Nilai Maksimal Prosiding Internasional			Nilai Akhir yang diperoleh
	Internasional Bereputasi	Nasional Terakreditasi	Nasional	
	(30)			
a. Kelengkapan unsur isi jurnal (10%)	3			2,6
b. Ruang lingkup dan kedalaman pembahasan (30%)	9			8,8
c. Kecukupan dan kemutahiran data/ informasi dan metodologi (30%)	9			8,0
d. Kelengkapan unsur dan kualitas penerbit (30%)	9			8,6
Total = (100 %)	30			28,0
Nilai Pengusul =				

Catatan Penilaian artikel oleh Reviewer :

. 1. **Kesesuaian dan kelengkapan unsur isi jurnal:**	:	Isi dari juurnal meliputi Abstract, Introduction, Experimental, Results and Discussion, Conclusions serta Reference. Artikel yang ditulis sudah meliputi akan hal tersebut. Kelengkapan jurnal terdiri dari ketua editor dan anggota, Reviewer,daftar isi, petunjuk penulisan juga ada. (skor= 2,6).
. 2. **Ruang lingkup dan kedalaman pembahasan:**	:	Fokus dan Scope dari prosiding ini sangat general yaitu physical sciences, including physics, math, chemistry, materials science and engineering. Artikel berisi tentang material membran dan uji dalam proses adsorpsi logam berat CR dengan mempelajaral pengaruh PH da NaCl. Tema ini masih termasuk dalam scope jurnal. Pembahasan sudah ada komparasi dan menceritakan tujuan dari setiap variasi yang dilakukani Metode yang digunakan dalam penulisan juga cukup baik demikian juga eksperimen. (skor= 8,8).
3. Kecukupan dan kemutakhiran data/informasi dan metodologi	:	Literatur yang digunakan terbaru adalah tahun 2017, walaupun masih dari Ybs. Dan hanya 1 buah skor= 8,0).
4. Kelengkapan unsur dan kualitas terbitan:	:	Penerbit dari IOP Publishing Journal Konferensi Edisi Internasional dengan 9 negara. Kualitas terbitan secara online dan cetak dan sudah terindeks di scopus (skor= 8.6).

Bidang ilmu/Unit kerja :Teknik Kimia/ Universitas Diponegoro

Semarang, 3/10/18
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NIP. 19720906 199803 1001

Nilai
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	Internasional Bereputasi	Nasional Terakreditasi	Nasional	
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c. Kecukupan dan kemutahiran data/ informasi dan metodologi (30%)	9			6,5
d. Kelengkapan unsure dan kualitas penerbit (30%)	9			7,0
Total = (100 %)	30			24,0
Nilai Pengusul =	0,6 × 24			14,4

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1. Kesesuaian dan kelengkapan unsur isi jurnal:	:	Isi dari artikel meliputi title, abstract, introduction, experimental, results and discussion, conclusion, dan References. Bagian conclusion terkesan aneh (skor = 2,5).
2. Ruang lingkup dan kedalaman pembahasan:	:	Ruang lingkup prosiding ini sangat luas, meliputi fisika, matematika, kimia dan ilmu dan teknologi material. Artikel berisi tentang pemisahan ion logam berat Cr (4) menggunakan membran shg masih termasuk dalam scope jurnal. Tujuan penulisan tdk ditulis dg jelas shg kesimpulan yg diambil jg tdk selari. Pembahasan mengenai pengaruh pH dan salinitas sebenarnya cukup mendalam tapi tidak didasari dg teori/pustaka yang memadai. Namun, dalam naskah bab pembahasan hanya terdapat 1 sitasi dari 12 daftar pustaka. Kesimpulan tdk sesuai dg hipotesis yg diajukan (skor=7,5).
3. Kecukupan dan kemutakhiran data/informasi dan metodologi	:	Pustaka yg digunakan kebanyakan sdh tua (9 dari 12 pustaka berusia lebih dr 10 tahun). Pd metodologi Nampak maksud/tujuan penelitian. Namun, pada metodologi justru tidak mendasarkan pada pustaka sama sekali (skor = 6,5).
4. Kelengkapan unsur dan kualitas terbitan:	:	Prosiding diterbitkan oleh IOP Publishing United Kingdom dg Editor Internasional beragam dari 9 negara. Penulis artikel dalam prosiding ini sebagian besar dari Indonesia. Walaupun terindeks Scopus, dalam terbitan secara online dan cetak dlm hal format dan kualitas Tabel dan Figure terlihat tidak konsisten. Penulisan Figure atau Fig. dlm teks tdk konsisten. Penulisan sitasi dlm teks tidak konsisten.Penulisan Daftar Pustaka tidak konsisten masing-masing penulis. (skor = 7,0).

Semarang,
Reviewer 2

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IOP Conference Series: Materials Science and Engineering
Volume 205, Issue 1, 9 June 2017, Article number 012010
2017 2nd International Conference on Materials Engineering and Nanotechnology, ICMEN 2017;
Kuala Lumpur; Malaysia; 12 May 2017 through 14 May 2017; Code 128591

Recovery of Chromium Metal (VI) Using Supported Liquid Membrane (SLM) Method, A study of Influence of NaCl and pH in Receiving Phase on Transport

(Conference Paper) (Open Access)

Djunaidi, M.C., Lusiana, R.A., Rahayu, M.D.

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Chemistry Departement, Diponegoro University, Indonesia

Abstract

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Chromium metal(VI) is a valuable metal but in contrary has high toxicity, so the separation and recovery from waste are very important. One method that can be used for the separation and recovery of chromium (VI) is a Supported Liquid Membrane (SLM). SLM system contains of three main components: a supporting membrane, organic solvents and carrier compounds. The supported Membrane used in this research is Polytetrafluoroethylene (PTFE), organic solvent is kerosene, and the carrier compound used is aliquat 336. The supported liquid membrane is placed between two phases, namely, feed phase as the source of analyte (Cr(VI)) and the receiving phase as the result of separation. Feed phase is the electroplating waste which contains of chromium metal with pH variation about 4, 6 and 9. Whereas the receiving phase are the solution of HCl, NaOH, HCl-NaCl and NaOH-NaCl with pH variation about 1, 3, 5 and 7. The efficiency separation is determined by measurement of chromium in the feed and the receiving phase using AAS (Atomic Absorption Spectrophotometry). The experiment results show that transport of Chrom (VI) by Supported Liquid membrane (SLM) is influenced by pH solution in feed phase and receiving phase as well as NaCl in receiving phase. The highest chromium metal is transported from feed phase about 97,78%, whereas in receiving phase shows about 58,09%. The highest chromium metal transport happens on pH 6 in feed phase, pH 7 in receiving phase with the mixture of NaOH and NaCl using carrier compound aliquat 336. © Published under licence by IOP Publishing Ltd.

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Topic: Liquid membranes | Extraction | Membrane ELM

Prominence percentile: 95.306

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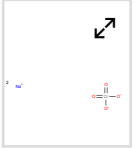
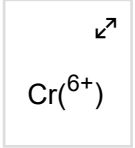

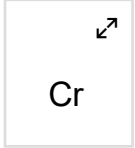

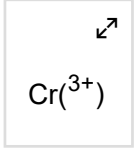

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1 De Agreda, D., Garcia-Diaz, I., López, F.A., Alguacil, F.J.
Supported liquid membranes technologies in metals removal from liquid effluents (Open Access)
(2011) *Revista de Metalurgia (Madrid)*, 47 (2), pp. 146-168. Cited 58 times.
http://revistademetalurgia.revistas.csic.es/index.php/revistademetalurgia/article/view/1187/1195
doi: 10.3989/revmetalmadrid.1062
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2 Choi, Y.-W., Moon, S.-H.
A study on supported liquid membrane for selective separation of Cr(VI)
(2004) *Separation Science and Technology*, 39 (7), pp. 1663-1680. Cited 8 times.
doi: 10.1081/SS-120030797
View at Publisher

3 Cleij, M.C., Scrimin, P., Tecilla, P., Tonellato, U.
Efficient and Highly Selective Copper(II) Transport across a Bulk Liquid Chloroform Membrane Mediated by Lipophilic Dipeptides
(1997) *Journal of Organic Chemistry*, 62 (16), pp. 5592-5599. Cited 21 times.
http://pubs.acs.org/joc
doi: 10.1021/jo9703257
View at Publisher

4 Bartsch, R.A., Dan Way, J.D.
(1996) *Chemical Separation with Liquid Membrane*, 642, pp. 1-6. Cited 74 times.
(CS Symposium Series) (Washington: American Chemical Society)

5 Djunaidi, M.C., Ulumuddin, K.
(2017) *IOP Conf. Series. Materials and Engineering*, 172.

6 Misra, B.M., Gill, J.S.
Supported Liquid Membranes in Metal Separations
(1996) *ACS Symposium Series*, 642, pp. 361-375. Cited 12 times.
View at Publisher

7 Solangi, I.B., Özcan, F., Arslan, G., Ersöz, M.
Transportation of Cr(VI) through calix[4]arene based supported liquid membrane
(2013) *Separation and Purification Technology*, 118, pp. 470-478. Cited 19 times.
doi: 10.1016/j.seppur.2013.07.037
View at Publisher

8 Khasanah, R.
(2001) *Desalination of Sea Water Using Supported Liquid Membrane (SLM)*
(Diponegoro University) Thesis

9 De Anil, K.
(1997) *Solvent Extraction of Metal*, pp. 81-100.
(New York: Van Nostrand Reinhold Company London)

10 Kocherginsky, N.M., Yang, Q., Seelam, L.
Recent advances in supported liquid membrane technology
(2007) *Separation and Purification Technology*, 53 (2), pp. 171-177. Cited 318 times.
doi: 10.1016/j.seppur.2006.06.022
View at Publisher

11 Beck, M.T.
(1990) *Chemistry Complex Equilibria.*, pp. 174-179. Cited 882 times.
(New York: Ellis Horwood Limited)

12 Rydberg Ed Marcel, D.
(1992) *Priciple and Practices of Solvent Extraction*, pp. 393-412. Cited 450 times.
Rydberg ed D. Marcel (New York)

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IOP Conference Series: Materials Science and Engineering, Volume 205, The 2nd International Conference on Materials Engineering and Nanotechnology 12–14 May 2017, Kuala Lumpur, Malaysia

2017 *IOP Conf. Ser.: Mater. Sci. Eng.* **205** 011001

https://doi.org/10.1088/1757-899X/205/1/011001

Abstract

Preface

It is our great pleasure to introduce you the proceedings of 2017 2nd International Conference on Materials Engineering and Nanotechnology (ICMEN2017) held in Kuala Lumpur, Malaysia during May 12-14, 2017. ICMEN2017 is dedicated to issues related to Materials Engineering and Nanotechnology.

The conference program covered keynote, oral and poster presentations from scholars working in the areas of materials science and engineering to establish platforms for collaborative research projects in this field, and to find potential opportunities for international cooperation. This conference covered recent trends and progresses made in the field of materials engineering and nanotechnology.

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H J Li, X D Zhou, J M Zhang, X Y Wu and H B Gao

IOP Conf. Series: Materials Science and Engineering **205** (2017) 012031 doi:10.1088/1757-899X/205/1/012031

Analysis of Wood Structure Connections Using Cylindrical Steel and Carbon Fiber Dowel Pins

Mikhail A. Vodiannikov[1*], Dr. Galina G. Kashevarova[1]

[1]Perm National Research Polytechnic University, Perm city, Russia, Komomilski Prospect, 29. Russian.
email: vodyannikov@mail.ru

Abstract. In this paper, the results of the statistical analysis of corrosion processes and moisture saturation of glued laminated timber structures and their joints in corrosive environment are shown. This paper includes calculation results for dowel connections of wood structures using steel and carbon fiber reinforced plastic cylindrical dowel pins in accordance with applicable regulatory documents by means of finite element analysis in ANSYS software, as well as experimental findings. Dependence diagrams are shown; comparative analysis of the results obtained is conducted.

1. Introduction

Wood is one of the most ancient building materials used up to the present days. The use of structural engineered wood products is undermined by its chemical, aesthetic, environmental, economic, etc. features. The items made of solid wood (timber, board, semi rigidly connected composite members), as well as glued laminated wood structures (glulam) are used in modern construction.

Nowadays laminated wood products are commonly used in many countries for wide span structures of different architectural shapes and sizes. An example of commercial structures is arch and noggin systems used for the construction of warehouses, airplane and ship sheds, bridges, etc. [1]. In civil construction, glulam is used for roofing of public buildings, swimming pools, sport and agricultural facilities [2].

2. Observation results of corrosive environment on materials

Based on long-term observation experience, wood is less subject to destructive environmental impacts. Wood performance properties in corrosive environment are advantageous in comparison to steel and reinforced concrete. During the period of service, no emergency situations due to wood's chemical corrosion occurred. However, wood structure connections designed nowadays with nails, steel bolts, dowels, split elements are subject to corrosion, which is the most common cause for emergency situations. Further, threats influencing the strength of structures manufactured of timber and steel dowel pins are considered.

The most significant wood strength reducing factor is humidity. By means of experiment we have determined that wood moisture content does not significantly depend on ambient conditions. Microclimate inside the structure is mostly constant with insignificant fluctuations depending on season. Structural wood moisture content accumulation and penetration into the section depends of the service period. Figure 1 shows the penetration of moisture content into structural element section with thickness over 150 mm and 40 years of service period (the data is obtained empirically by selection and analysis of samples of existing structures).

IOP Conf. Series: Materials Science and Engineering **205** (2017) 012008 doi:10.1088/1757-899X/205/1/012008

Silver-Loaded Cellulose Acetate-g-Poly(ε-caprolactone) Composites

CR Tuburan[1], LE Dela Rosa[1] and LQ Reyes[1]

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Abstract. Cellulose acetate (CA) was grafted with poly(ε-caprolactone) PCL oligomers via the ring-opening of ε-caprolactone (ε-CL) monomer initiated by the hydroxyl functionality of CA. The incorporation of short PCL oligomers in CA's structure caused the transformation of it crystalline domains into amorphous phases (internal plasticization) as observed by differential scanning calorimetry (DSC). Another evidence of plasticization induced by grafting was the significant reduction of the degradation temperature and stiffness of the copolymers. Proton Nuclear Magnetic Resonance (^{1}H-NMR), Fourier-Transform Infrared (FTIR) Spectroscopies and Gel Permeation Chromatography (GPC) verified success the grafting as suggested by the attachment of PCL on the glucose ring and increase in polymer molecular weights after the reaction. Due to the good films forming ability of the synthesized CA grafted with PCL (CA-g-PCL) material, it was loaded with silver nitrate ($AgNO_3$) and the composite was observed to be have bactericidal against a gram negative bacteria, *Escherichia coli*, and a gram positive bacteria, *Bacillus subtilis*.

1.Introduction

Biodegradable polymers propose an appealing remedy to the environmental problem of plastic waste accumulation and disposal; however, their properties such as poor mechanical properties, high permeability to gases and poor processibility have limited their use to a narrow variety of applications. [1]. The natural polysaccharides cellulose and starch are excellent candidate for making of low-cost materials for high technology applications and to improve their physical, chemical and processing properties of these materials, low molecular weight additives is required (external plasticization) [2], [3]. On the other hand, covalently linking lactones and carboxylic acids to these polysaccharide chain is one method of improving their processing properties (internal plasticization). This technique introduces defects in the crystalline domains and disrupts inter and intrachain hydrogen bonding within the polysaccharide structure [2]. One of the most commonly explored polysaccharide derivative for a myriad of applications is cellulose acetate (CA), synthesized by the reaction of cellulose with acetic anhydride [4]. While the acylation process improves the processibility of cellulose (ie. solubility in many organic solvents), the resulting material has high stiffness and brittleness, agin limiting its application [3]. And so, the rigidity of CA can be tuned by grafting aliphatic polyesters to the hydroxyl group of CA by chemical means. The biodegradable polyester poly(ε-caprolactone) (PCL) has been used as a plasticizer to CA producing a material with characteristics better than their individual polymers. Nevertheless, the high price of PCL has prevented its widespread industrial use. The development of polymer graft is an alternative to reduce costs and tune material properties [3].

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Influence of Nano-3%Al_2O_3 on the Properties of Low Temperature Sn-58Bi (SB) Lead-free Solder Alloy

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Abstract. This work studies the melting temperature, wettability, metallurgical and hardness properties of the Sn-58Bi (SB) lead-free solder alloy incorporated with nano-3%Al_2O_3**.** The melting temperature was observed at 143.44 ℃ upon the additions of the nano-3%Al_2O_3 with a low contact angle of 20.4 °. A well-distributed microstructure with narrower lamellar structure and finer intermetallic compounds and Sn grains was detected for the nano-3%Al_2O_3 added SB solder alloy. Hardness evaluation based on the Vickers hardness value was as high as 17.1Hv. Overall, the Sn-58Bi + 3% Al_2O_3 solder alloy appears to harvest beneficial results for these properties and can be used as potential replacement in the current electronic packaging industry.

1. Introduction

Ultimately, efficiency of a solder alloy depends on the alloying process and examples such as Sn-Pb, Sn-Bi and Sn-Ag-Cu are a mixture of one or more elements producing a solder alloy. Alloying seems to boost the performance of a solder alloy by enhancing its property such as lowering the melting temperature (e.g. Sn-Pb, Sn-Bi), producing high hardness (e.g. Sn-Zn-Bi) and better wetting for better joint property [1]. Among many solder alloys, the Sn-Bi (SB) solder alloys are pointed out to be the potential candidate to be used in the electronic packaging industry. Studies by [2] and [3] agrees to this point. However, the SB solder alloys has drawback such as low mechanical properties and these properties are key to ensure the functional integrity of the electrical component [4]. Therefore, introductions of nanoparticle appears to overcome the concern [5]. Parallel to that, the melting, mechanical and metallurgical properties of the low melting temperature Sn-58Bi (SB) added with 3% Al_2O_3 nanoparticles solder alloy were studied in this research. The results were analysed and further discussed to provide information in this area of studies.

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Hot Deformation Behavior of High Strength Low Alloy Steel by Thermo Mechanical Simulator and Finite Element Method

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Abstract. The hot deformation behavior of HSLA steel was investigated by using a MMS-200 thermal mechanical machine at different conditions and with deformation temperature of 800-1100 ^{o}C and strain rate of 0.1-10 S^{-1}. FEM was analyzed the deformation characteristics of hot compression through Deform-3D software. It was discovered that the flow stress increases with increasing strain rate and decreasing temperature. The activation energy and stress exponent during hot deformation were calculated using hyperbolic sine constitutive equations. The result from the experiment represents the activation energy and stress exponent during hot compression of 222.256 kJ/mol. and 10.84. The prediction of distribution stress values from the constitutive equation in Deform-3D can be matched with the experimental results.

1. Introduction

High strength low alloy steel (HSLA) is a type of steel widely used for structural construction. Steels with low carbon content and very small additions of strong carbide or carbonitride forming elements such as Nb, V, and Ti to strengthening precipitation and grain refinement are called microalloyed or high strength low alloy steel [1]. These steels are much stronger and tougher than ordinary carbon steels, more ductile, highly formable, weldable and highly resistant to corrosion. Nowadays, HSLA steel has been improved with suitable chemical composition and thermo mechanical treatment in order to reinforce its application in heavy industries and automotive.

Recently, HSLA steel has been investigated for several features, including its hot deformation behaviors. Hot deformation process is necessary to improve the effectiveness of HSLA steel. With the increasing use of FEM (finite element method) to simulate the specimen behavior under the various parameter of compression test. The relationships between the constitutive equation and the relating process variables such as strain rate and temperature to the flow stress of the deforming material is required, and it is important to calculate the flow stress[2]. Flow stress can be defined as the resistance of a material against plastic deformation and it is expressed as a function of temperature, strain, and strain rate. Hence, FEM technique provides an effective approach for evaluating and determining the distribution and variation of thermo mechanical parameters in deformed specimens during hot working [3,4].

In this paper, the influence of characteristic hot deformation behavior of HSLA steel during compression test at different temperature and strain rate will be investigated. The general constitutive equations were used to determine the hot deformation constants of the material from experimental

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